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Do Grasswrens have the numbers? Reply to Woinarski (1992)

In attempting to reconcile the disparate views about the status of the White-throated Grasswren *Amytornis woodwardi*, Woinarski (1992) has presented a somewhat tendentious argument. Collar & Andrew (1988) and Kennedy (1990) may have considered the species "near-threatened" or "potentially vulnerable", but neither have studied the species, nor evidently examined my report; indeed their assessments were based on the advice of other biologists. The labelling of the species as "notable" by Woinarski *et. al.* (1989) was considered "perplexing" by Holmes & Noske (1990) because: (a) the work of Noske (1988) was cited, but its conclusions ignored; and (b) the term "notable" had the distinct connotation of rarity and / or endangered status (see Braithwaite & Woinarski (1990) and Woinarski & Braithwaite (1990)). It is noteworthy that three other species categorised as rare

or endangered by Braithwaite & Woinarski (1990) (on the basis of a draft list) were also "downgraded" by Brouwer & Garnet (1990).

As Woinarski states, the methodology I adopted for censusing Grasswrens differed from that of ordinary surveys. I believe this method (active searching) was appropriate, however, given (a) the budgetary constraints (over which I had no control); and (b) the nature of the species. Instantaneous (quadrat) counts, as advocated by Woinarski, would have been a singularly inappropriate method for locating Grasswrens, which are masters of the art of being invisible. Due to its cryptic behaviour, this species is notoriously difficult to locate, even within known territories. Their songs are rather feeble and difficult to detect, and their contact calls are given mainly in response to disturbance. Such birds are likely to be undercounted using instantaneous quadrats, resulting in many zero scores, and yielding little information for time invested. It is no coincidence that three other members of this genus "disappeared" from the world for six or more decades, only to be reincarnated after a proper search.

After searching an area for Grasswrens, G. Holmes and I estimated the areas covered from 1:100,000 topographic maps. The areal values did include patches of unsuitable habitats (vine forests and eucalypt woodland without rocks). Woinarski correctly states that I excluded sites where no Grasswrens were found (e.g. Diamond Creek) from my population densities: nor were they included in the area of suitable habitat used in the calculation of total population densities. It would be inappropriate to include densities for sites that were considered unsuitable habitat.

Woinarski uses the vegetation map of Schodde *et al.* (1987) to show that I overestimated the amount of suitable habitat in Kakadu, "by a factor of five". Based on my assumption that one-quarter of the suitable habitat (and one quarter of the grasswrens) were in Kakadu, he uses his own estimates of Grasswren density to derive a total population estimate of only 7,125 birds. The accuracy of this population estimate cannot be tested without additional data, but its credibility can be assessed by examining some of the attendant premises.

(a) one quarter of the habitat is in Kakadu NP. The map from the recently produced Vegetation Survey of the NT map (Wilson *et al.* 1990) provides a convenient check on the viability of this premise. Using a planimeter, I estimate the area of suitable habitat (represented by Mapping Unit 32) within the known range of the Grasswren as 10,550 km². About 1,320 km² of this area occurs within Kakadu. This represents c. 12.5%, indicating that I over-estimated the amount of suitable habitat in Kakadu by a factor of two. Unfortunately, this estimate is also twice the area cited by Woinarski (based on Schodde's map). However, assuming that the proportion of habitat within Kakadu is 12.5%, and using Woinarski's Grasswren density estimate of 0.027 birds/ha, the total population size should be about 14,000 - not less than 10,000 as Woinarski contends.

(b) one-quarter of the habitat equates with one-quarter of the population. This assumption (made by both Woinarski and me) is fraught with difficulty, as the

density of birds can be expected to vary geographically with the amount of optimum habitat (elevated, flat plateaux: Noske 1988) and degree of fire protection. For example, about one-half of the suitable habitat in Kakadu lies some distance west of the main Arnhem sandstone plateau. Such isolated sites may be expected to have sub-populations with low Grasswren densities (on average), due to generally greater exposure to fire, and a smaller pool of potential colonists from which to recruit more birds. Lower average densities in Kakadu would tend to deflate, rather than inflate, our extrapolated total population estimates.

I find the claim that areas made temporarily uninhabitable by fire should not be included in derivations of population estimates difficult to accommodate. Any estimate of total population size is contingent upon the vagaries of natural or anthropogenic disasters affecting some or all of the species' sub-populations. Such estimates are merely a "snap-shot" of abundance, based on densities over a range of sites at a particular time. We intentionally visited sites with differing degrees of fire damage, including recently-burnt sites, to take such effects into account.

Woinarski contends that fire is a major threat to the species, citing the Carpentarian Grasswren as an example of another fire-threatened species. The analogy is imperfect, however, because the latter species occurs in disjunct populations, inhabiting relatively small outcrops with little fire protection, compared to the heavily dissected terrain occupied by the White-throated Grasswren (see also Schodde 1982). Woinarski has attempted to show that fire will adversely affect Grasswrens by comparing the densities at my recently-burnt sites with those of past-burnt sites. This comparison ignores the fact that most sites had apparently been burnt at some time over the last few years. Indeed I was impressed by the ability of Grasswrens to survive in areas of recent severe fires. Lower bird densities in such areas may be a short-term (temporary) phenomenon. Paradoxically, Grasswrens sub-populations might suffer longer term damage as a result of lack of fire (Noske 1988, 1992). Fire *may* have contributed to the decline of the East Alligator ("Cyril Springs" in Noske 1992) sub-population. Other factors include over-exploitation by a known (past) egg-collector, and a probable slow population recovery rate due to its peripheral, isolated location.

I appreciate the need to be prudent in designating the status of little-known species. I also accept Woinarski's criticism of my population calculations. However, I am still confident that the White-throated Grasswren is reasonably secure, with a total population size in excess of 10,000. As I look through the list of threatened bird species for Australia, I am struck by one profound fact: there has been only one avian extinction on the Australian mainland in the last two centuries (Brouwer & Garnett 1990; Garnett 1992). This situation contrasts sharply with that for the Australian terrestrial mammals, which have suffered more than any other continental mammal fauna in historical times. This is not to say that concern about the conservation of birds is unwarranted, but as biologists, we need to recognise that

the economic realities of conservation demand that those species or communities most sensitive to disturbance, and/ or at greatest risk of extinction, are given priority over less convincing cases.

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